

BALANCED BODY ANATOMY IN THREE DIMENSIONS™



An Introduction to
Anatomy for Movers and
Movement Educators

Torso to Upper Body

The Shoulder and The Arm

Including the bones, muscles and actions of the shoulder and arm

Muscles of the Shoulder and Arm

Rotator Cuff

- Subscapularis
- Supraspinatus
- Infraspinatus
- Teres Minor

Elbow Extensor

- Triceps Brachii



Elbow Flexors

- Brachialis
- Coracobrachialis
- Biceps Brachii

Scapular Actors

- Serratus Anterior
- Rhomboids
- Pectoralis Minor
- Levator Scapulae

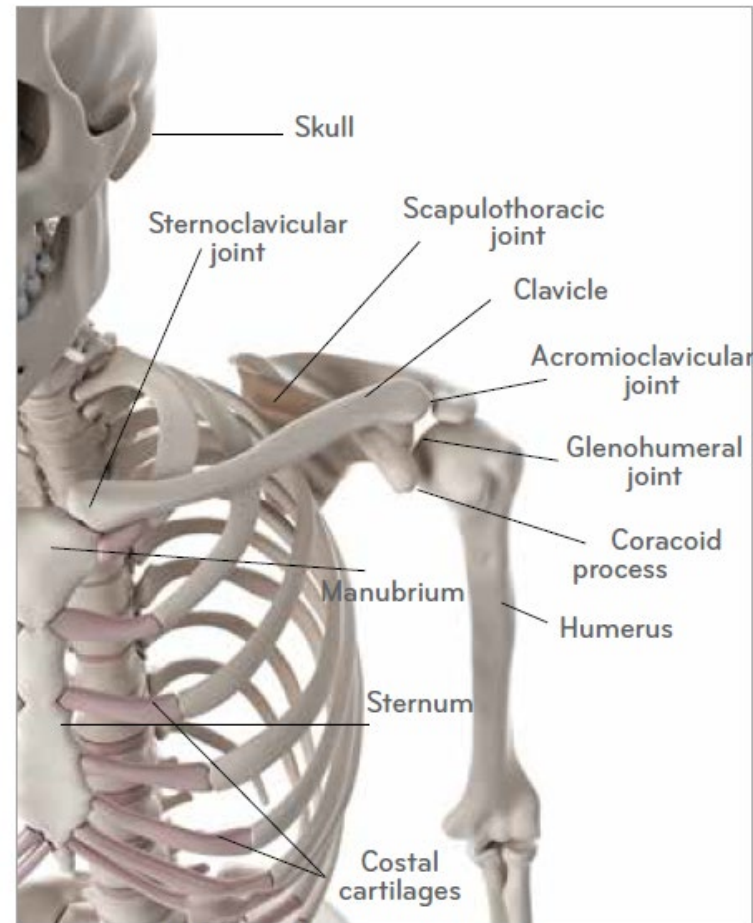
Bones of the Shoulder and the Arm

The shoulder girdle is made up of three synovial joints:

- The sternoclavicular joint (SC joint)
- The acromioclavicular joint (AC joint)
- The glenohumeral joint

And 1 non-synovial joint

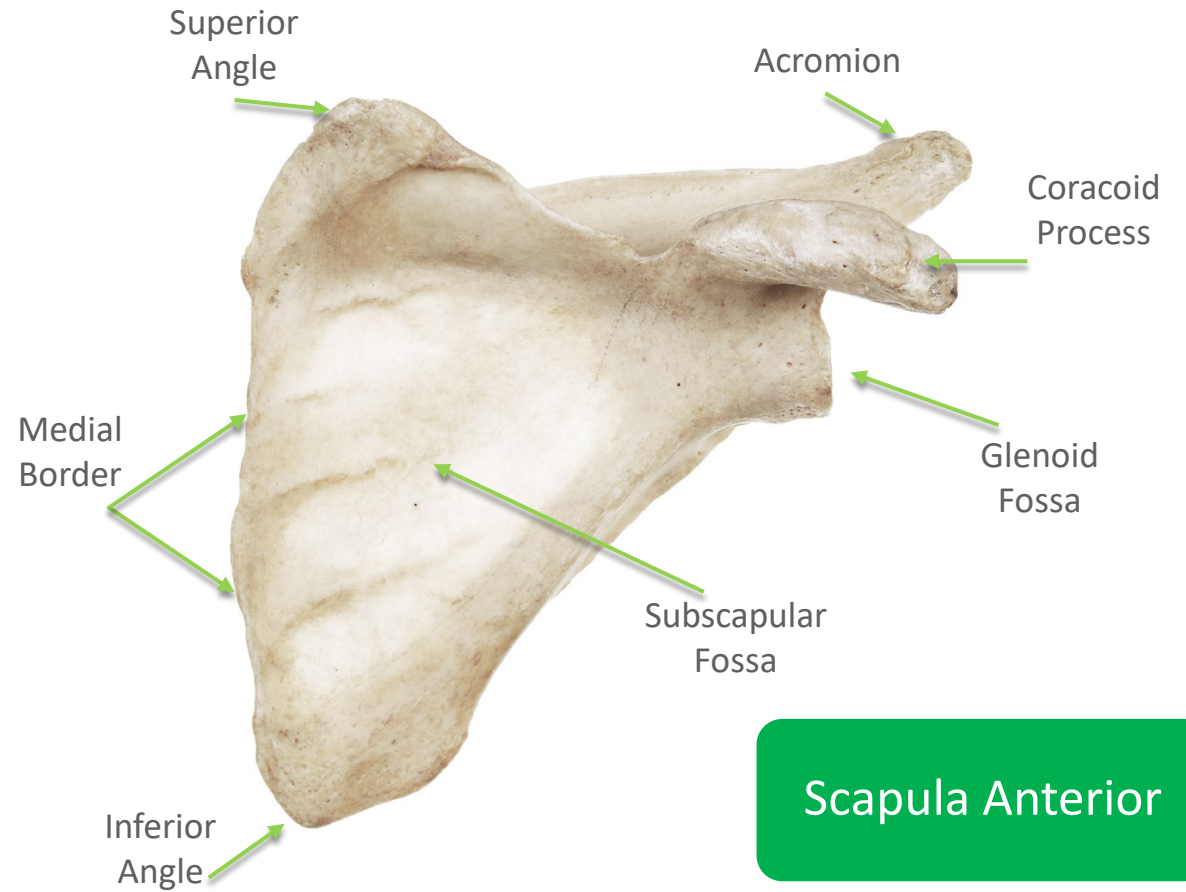
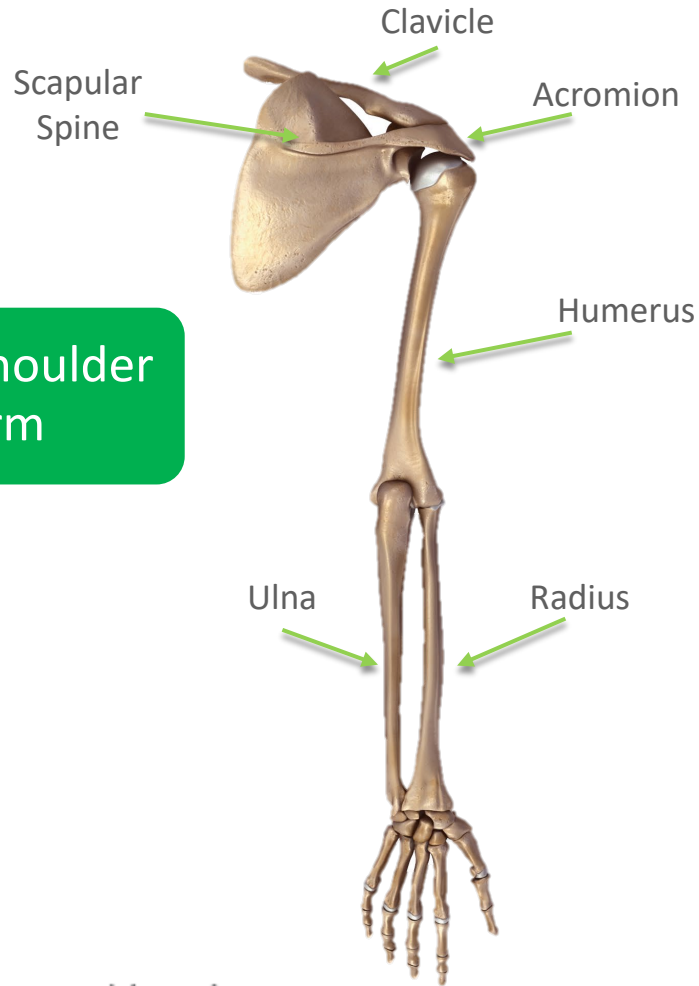
- The scapulothoracic joint
- Comprised of the movement of the scapula over the ribcage.



Bones of the upper body, anterior.

Scapula and Arm

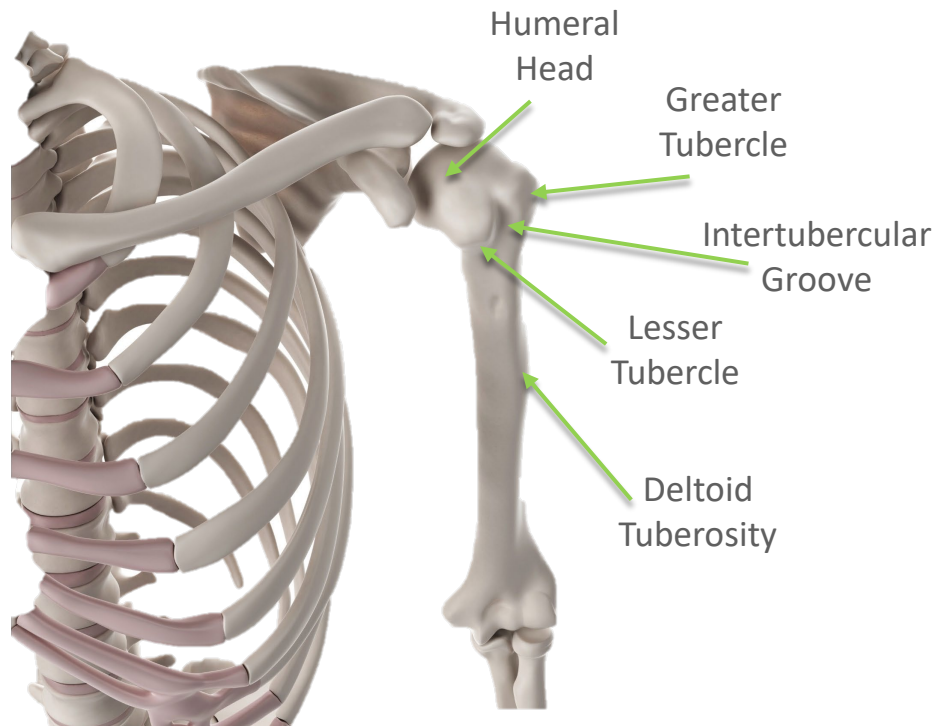
Posterior Shoulder and Arm



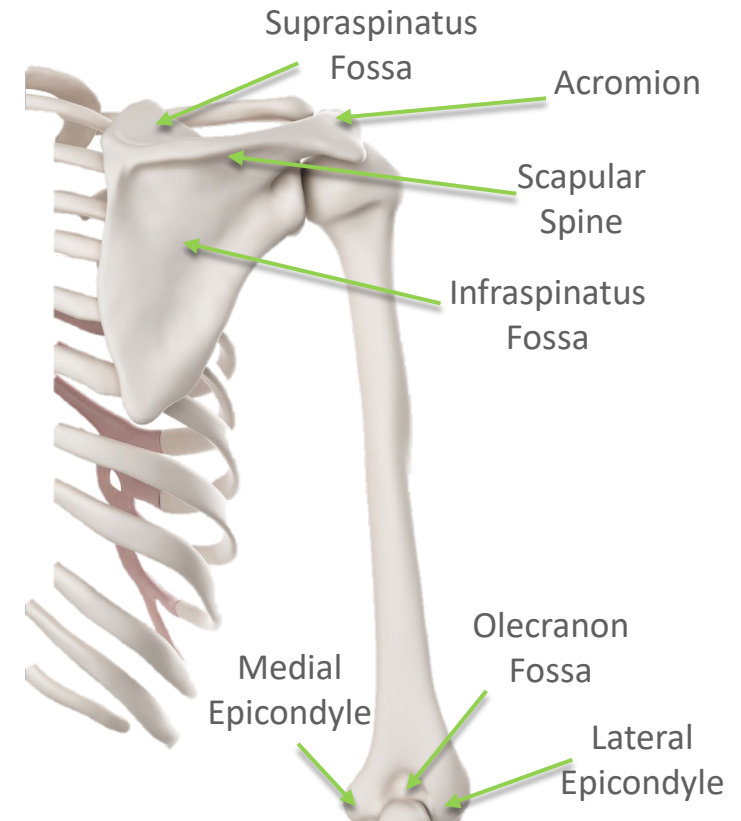
Scapula Anterior

Scapula and Arm

Anterior: Clavicle and Humerus

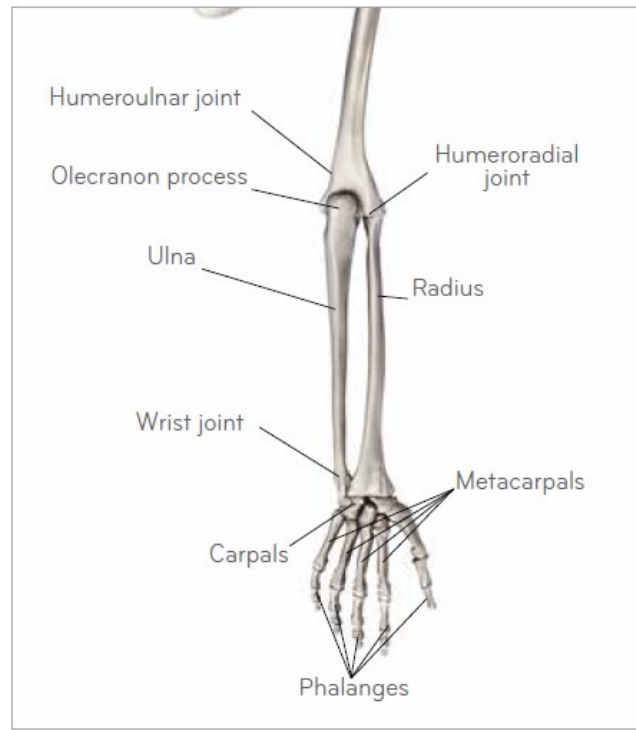


Posterior: Scapula and Humerus



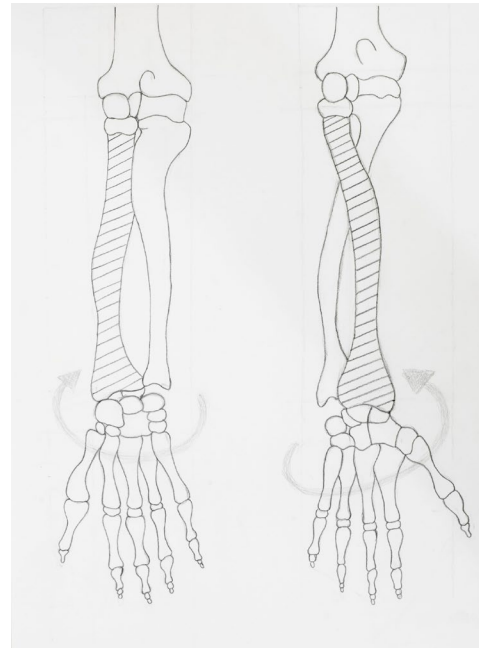
Bones of the Forearm and Hand

Radius and Ulna

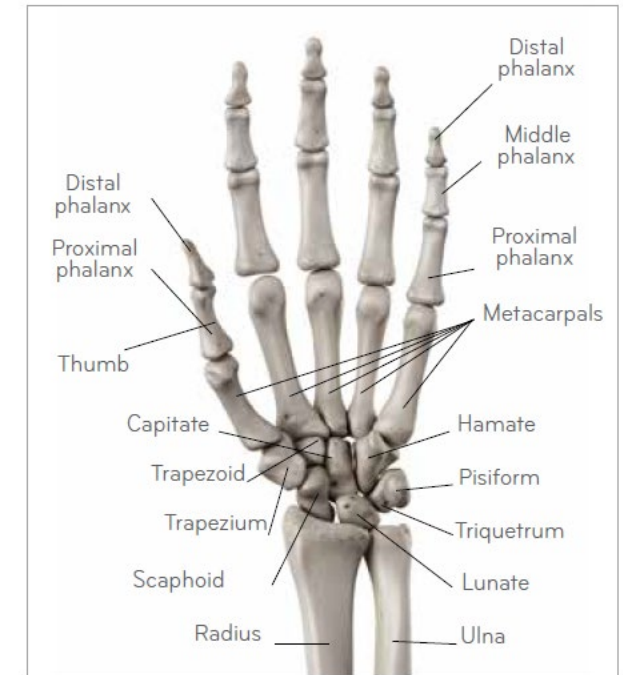


Bones of the lower arm

Hand – Metacarpals and Phalanges



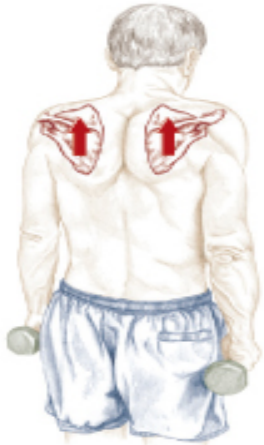
Forearm Pronation and Supination



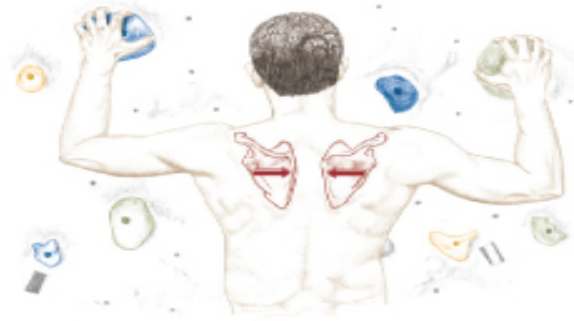
Bones of the wrist and hand

Scapula

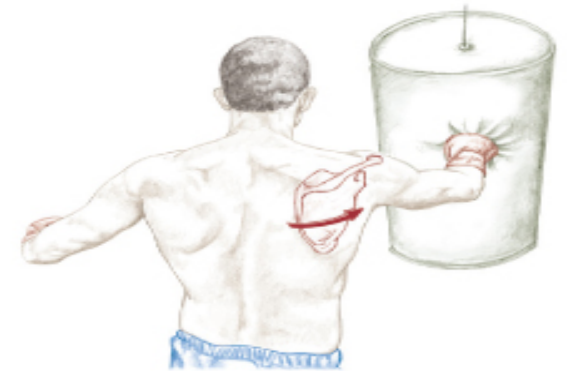
(scapulothoracic joint)



Elevation



**Adduction
(retraction)**

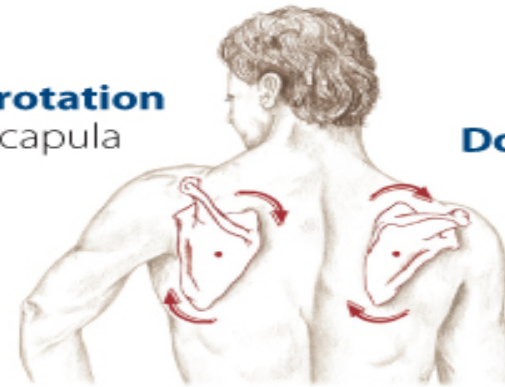


**Abduction
(protraction)**

Depression



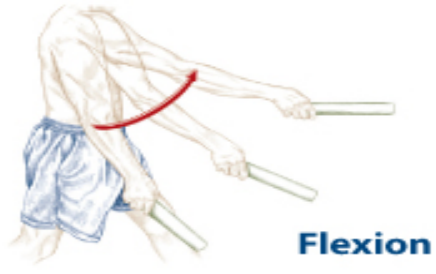
**Upward rotation
of left scapula**



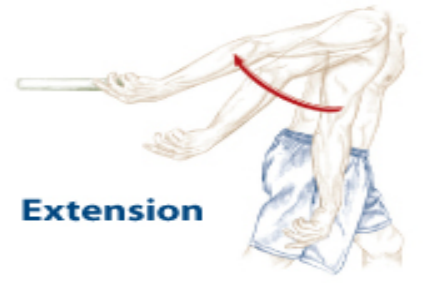
**Downward rotation
of right scapula**

Shoulder

(glenohumeral joint)



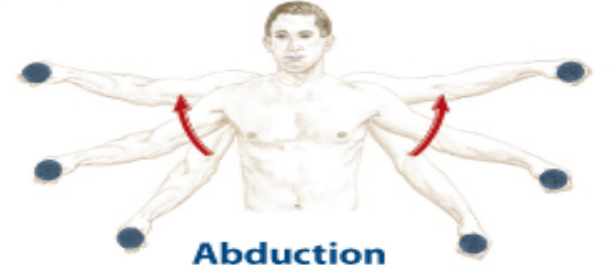
Flexion



Extension



Adduction



Abduction



Horizontal adduction



Medial rotation
(internal rotation)



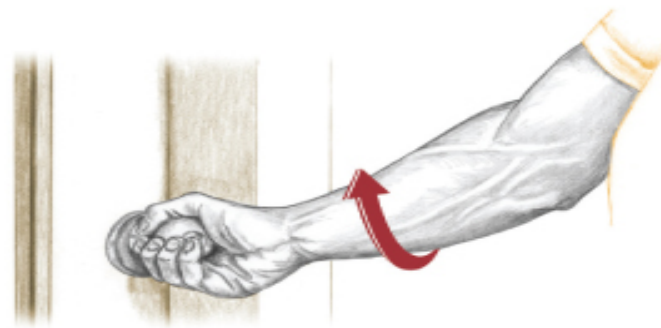
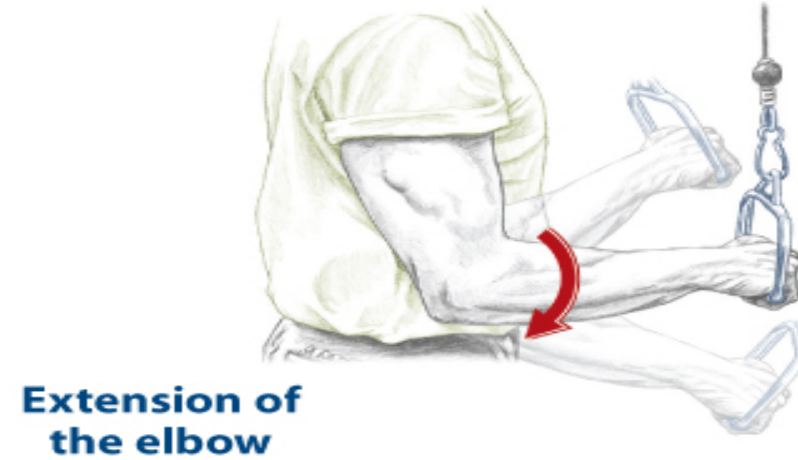
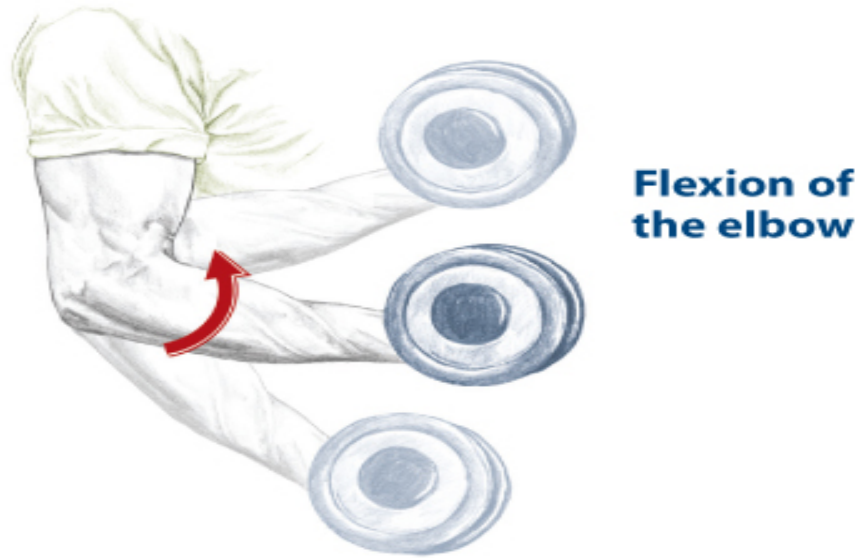
Horizontal abduction



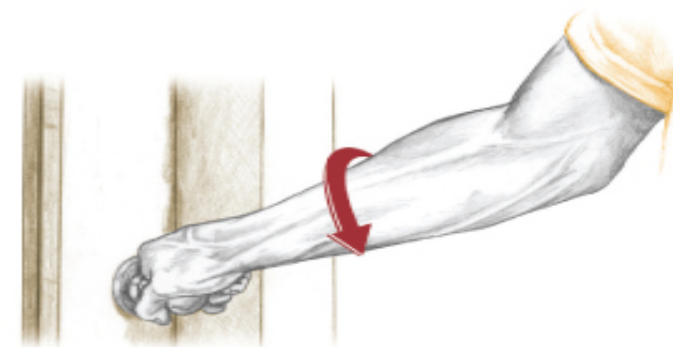
Lateral rotation
(external rotation)

Elbow and Forearm

(humeroulnar and humeroradial joints – elbow, proximal and distal radioulnar joints – forearm)



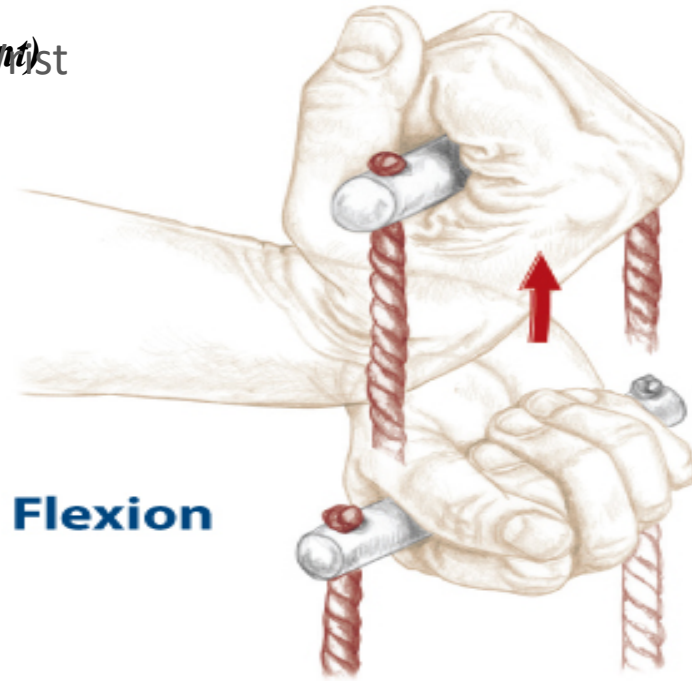
Supination of the forearm



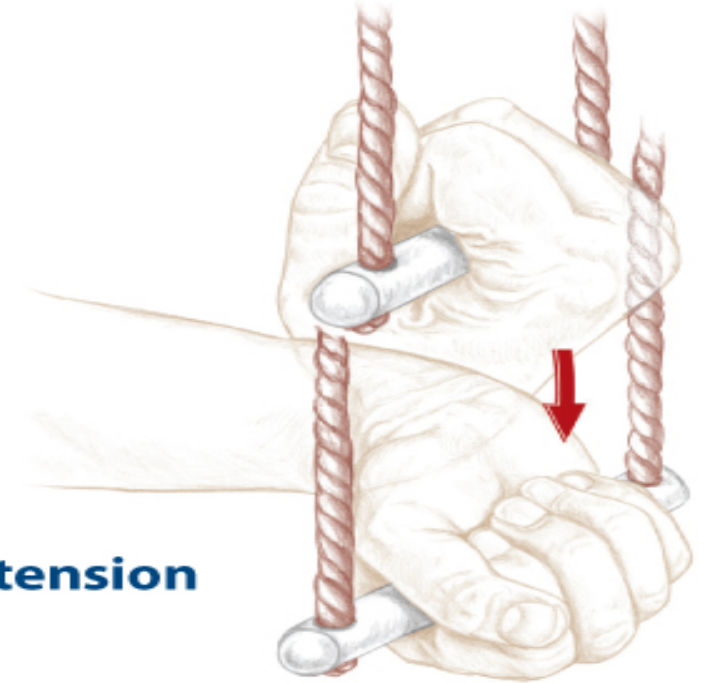
Pronation of the forearm

Wrist

Movements of *(radiocarpal joint)* Wrist



Flexion



Extension



Adduction
(ulnar deviation)



Abduction
(radial deviation)

Thumb

(first carpometacarpal and metacarpophalangeal joints)



Flexion



Extension



Opposition



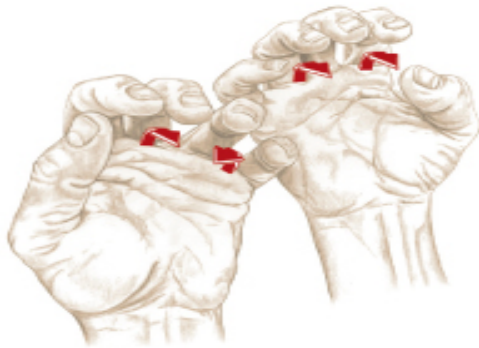
Adduction



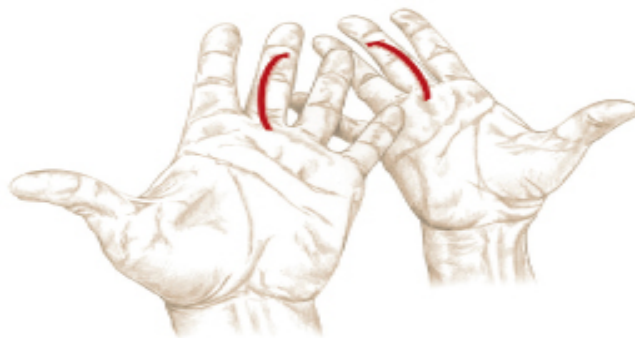
Abduction

Fingers

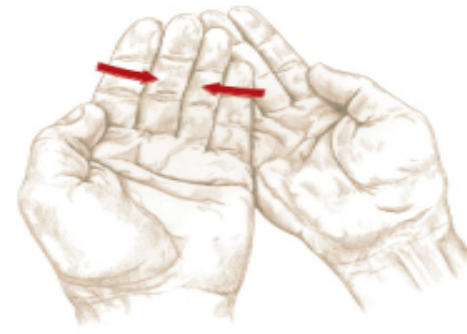
(metacarpophalangeal, proximal and distal interphalangeal joints)



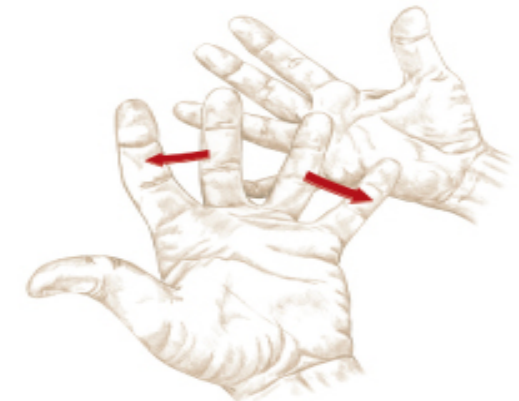
Flexion



Extension



Adduction



Abduction

Rotator Cuff Muscles



Rotator Cuff Muscles:

- Hold the humeral head in the glenoid fossa
- Maintain congruency of the joint
- Endurance muscles

Subscapularis

Supraspinatus

Infraspinatus

Teres Minor

Subscapularis

Origin:

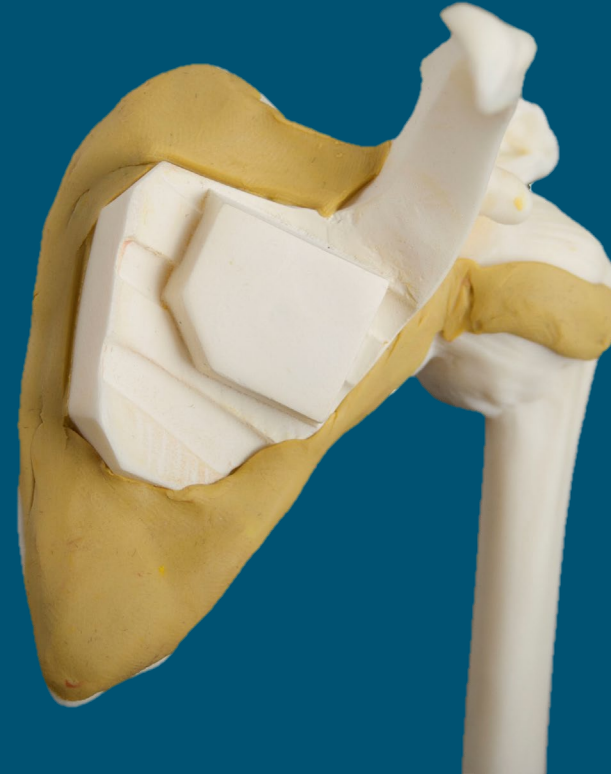
- Entire anterior surface of subscapular fossa.

Insertion:

- Lesser tubercle of humerus.

Actions:

- Medial rotation, adduction and extension of glenohumeral joint.



Supraspinatus

Origin:

- Medial two thirds of supraspinous fossa.

Insertion:

- Superiorly on greater tubercle of humerus.

Actions:

- Glenohumeral abduction (primarily active in first 30 degrees) and stabilizes humeral head.



Infraspinatus

Origin:

- Medial aspect of infraspinous fossa just below spine of scapula.

Insertion:

- Posteriorly on greater tubercle of humerus.

Actions:

- Lateral rotation, extension and horizontal abduction of glenohumeral joint.



Teres Minor

Origin:

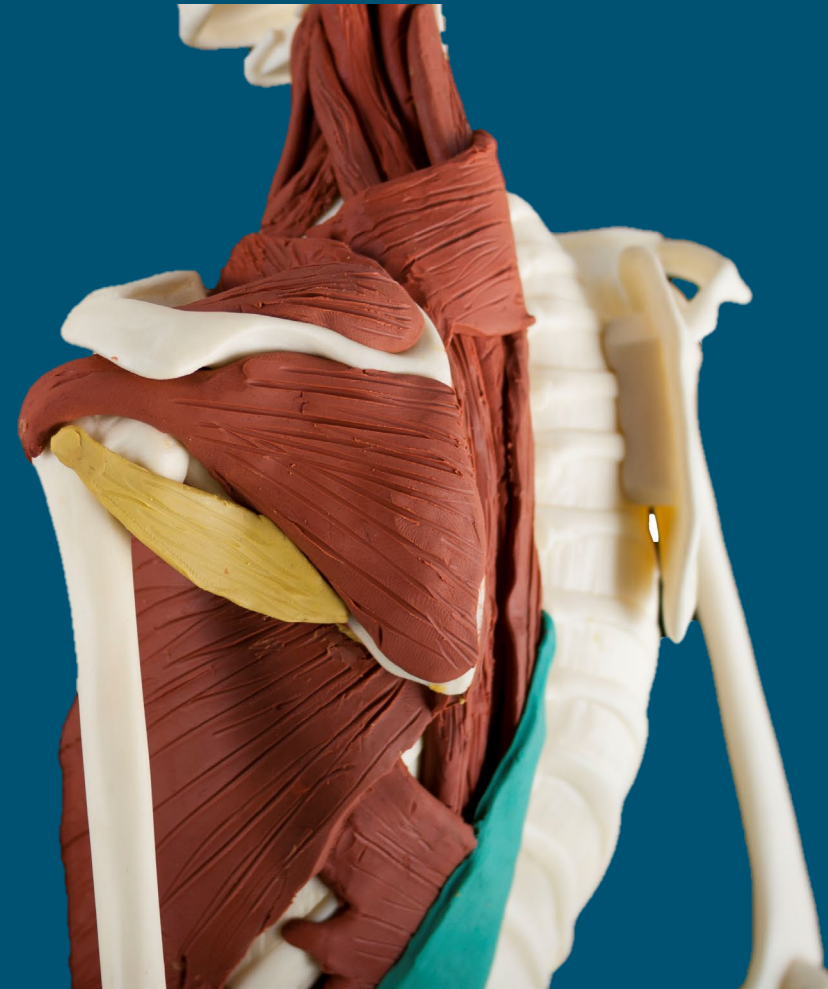
- Posteriorly on middle third of lateral border of scapula.

Insertion:

- Posteriorly on greater tubercle of humerus.

Actions:

- Lateral rotation, extension and horizontal abduction of glenohumeral joint.



Rotator Cuff Muscles

MUSCLES	Lateral Rotation	Medial Rotation	Extension	Adduction	Abduction	Horizontal Abduction
Subscapularis		X	X	X		
Supraspinatus					X	
Infraspinatus	X		X			X
Teres minor	X		X			X

Muscles of the Upper Arm –Extensors



Teres Major

Triceps Brachii

Teres Major

Origin:

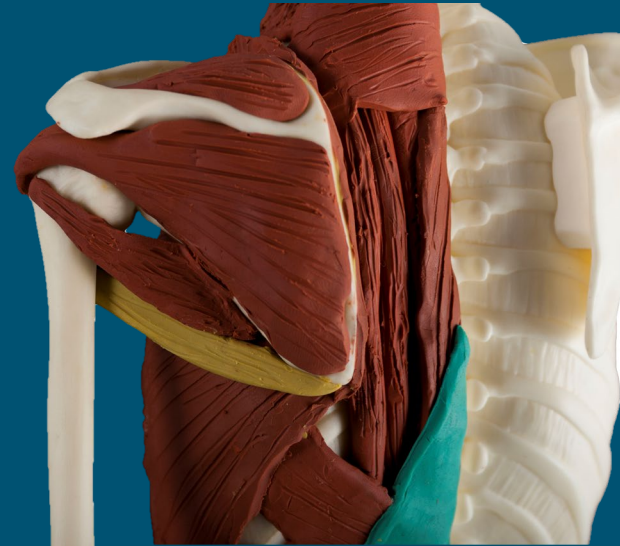
- Posteriorly on inferior third of lateral border of scapula. (Just superior to the inferior angle)

Insertion:

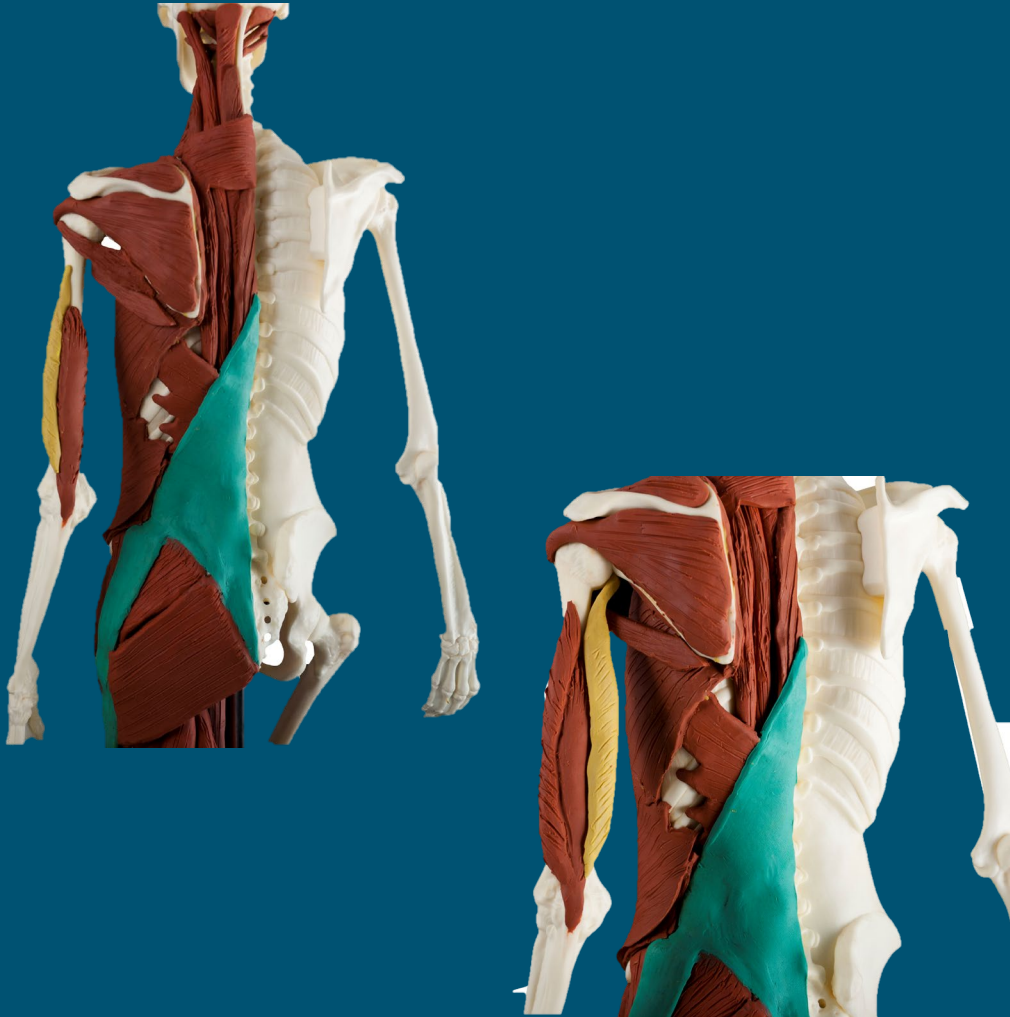
- Anteriorly on the crest of lesser tubercle of humerus.

Actions:

- Shoulder extension, adduction.
- Medial rotation of the glenohumeral joint.



Triceps Brachii



Origin:

Medial head

- Distal two-thirds of posterior surface of humerus.

Long head

- Infraglenoid tubercle below inferior lip of glenoid fossa of scapula.

Lateral head

- Upper half of posterior surface of humerus.

Insertion:

- Olecranon process of ulna.

Actions:

- Elbow extension and shoulder extension (long head only).

Muscles of the Upper Arm – Elbow Flexors



Brachialis

Coracobrachialis

Biceps Brachii

Brachialis

Origin:

- Distal half of anterior portion of humerus.

Insertion:

- Coronoid process of ulna.

Actions:

- Elbow flexion.



Coracobrachialis

Origin:

- Coracoid process of scapula.

Insertion:

- Middle of medial border of humeral shaft.

Actions:

- Glenohumeral joint
 - flexion
 - adduction
 - horizontal adduction



Biceps Brachii

Origin:

Long head

- Superior border of glenoid fossa.

Short head

- Coracoid process of scapula.

Insertion:

- Radial tuberosity and aponeurosis of biceps brachii.

Actions:

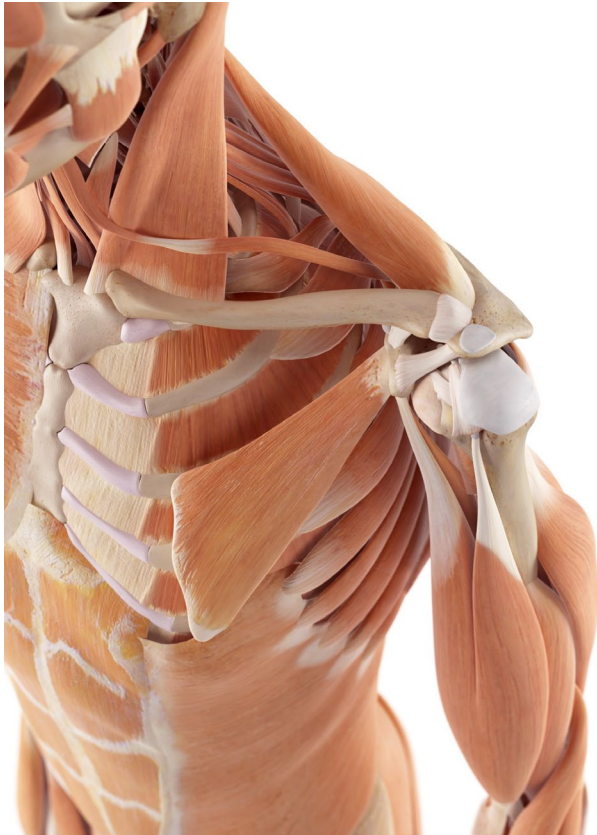
- Elbow flexion.
- Shoulder flexion.
- Forearm supination.



Muscles of the Upper Arm

MUSCLES	Elbow Flexion	Elbow Extension	Glenohumeral Flexion	Glenohumeral Extension	Glenohumeral Adduction	Glenohumeral Horizontal Adduction
Triceps Brachii		X		X		
Brachialis	X					
Coracobrachialis			X		X	X
Biceps Brachii	X		X			

Muscles with actions on the Scapulae



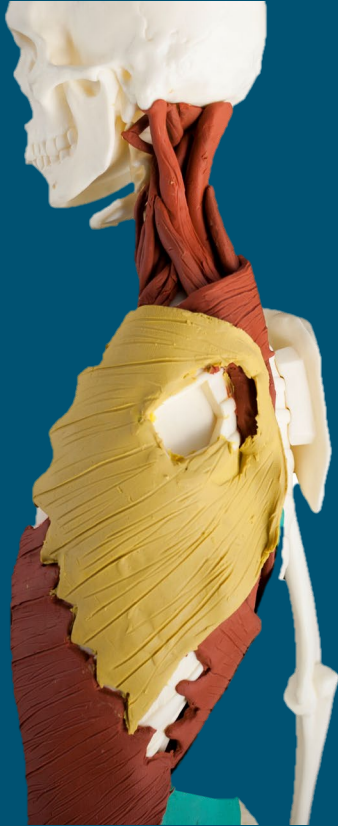
Serratus Anterior

Rhomboids

Pectoralis Minor

Levator Scapulae

Serratus Anterior



Origin:

- Surface of upper nine ribs at on the lateral side of the costochondral junction.

Insertion:

- Anterior aspect of the entire length of the medial border of scapula.

Actions:

Scapular

- Protraction
- Upward rotation
- Stabilization

Rhomboid Minor



Origin:

- Spinous processes of C7 and T1.

Insertion:

- Medial border of scapula (level with the scapular spine).

Actions:

Scapular

- Adduction/Retraction
- Elevation
- Downward rotation

Rhomboid Major



Origin:

- Spinous processes of T2-T5.

Insertion:

- Medial border of scapula (below the scapular spine).

Actions:

Scapular

- Retraction
- Elevation
- Downward rotation

Pectoralis Minor



Origin:

- Anterior surfaces of 3rd-5th ribs.

Insertion:

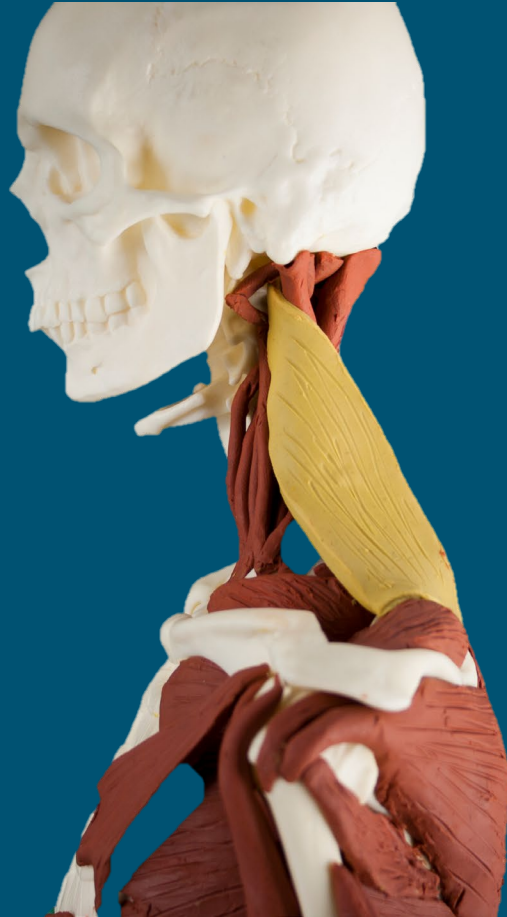
- Coracoid process of scapula.

Actions:

Scapular

- Protraction
- Downward rotation
- Depression

Levator Scapulae



Origin:

- Transverse processes of upper four cervical vertebrae.

Insertion:

- Superior angle of the scapula.

Actions:

Scapula

- Elevation
- Downward rotation
- Assist with adduction

Neck and Head

- Unilaterally: Lateral flexion, same side rotation
- Bilaterally: Cervical extension

Muscles of the Scapula

MUSCLES	Scapula Elevation	Scapula Depression	Scapula Protraction	Scapula Retraction	Scapula Upward Rotation	Scapula Downward Rotation
Serratus Anterior			X		X	
Pectoralis minor		X	X			X
Pectoralis major and minor	X			X		X
Levator Scapulae	X			X		X

Upper Body Large Mover Muscles



Latissimus Dorsi

Pectoralis Major

Deltoid

Trapezius

Latissimus Dorsi



Origin:

- Via the thoracolumbar fascia to posterior crest of ilium, back of sacrum and spinous processes of lumbar.
- Spinous processes of the lower six thoracic vertebrae with slips to lower three ribs.

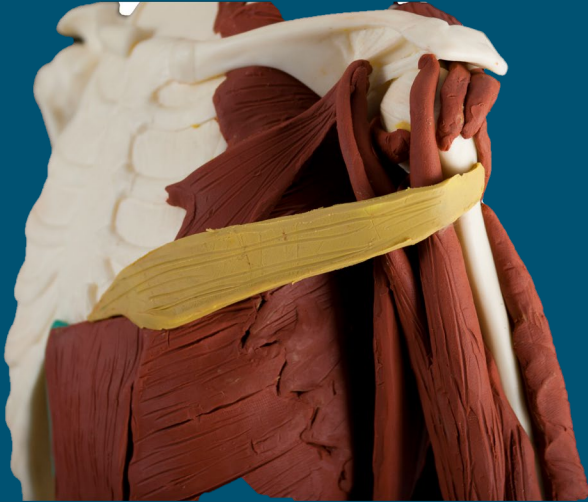
Insertion:

- Medial side of intertubercular groove of humerus.

Actions on Glenohumeral Joint:

- Extension
- Adduction
- Horizontal abduction
- Medial rotation

Pectoralis Major



Lower Fibers Origin:

- Superior attachment on the sheath of the rectus abdominis muscle



Middle Fibers Origin:

- Anterior surfaces of costal cartilage of first 6 ribs and adjacent portion of sternum.



Upper Fibers Origin:

- Medial half of inferior surface of clavicle.

Insertion:

- Via a flat tendon 2 – 3 inches wide to outer lip of intertubercular groove of humerus.

Actions:

- Returns the arm to the position it would take in all fours
- Adduction, horizontal adduction and medial rotation

Deltoid



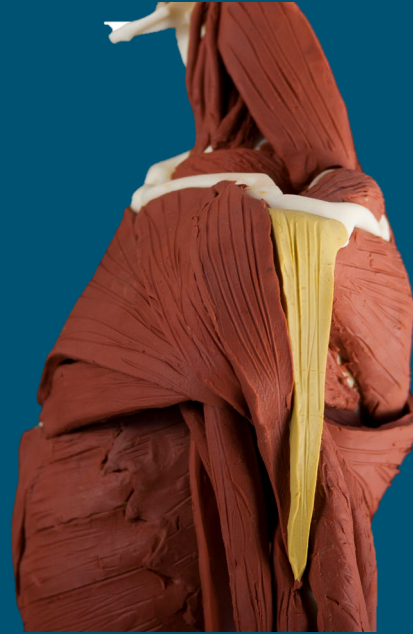
Anterior Fibers

Origin:

- Anterior lateral third of clavicle.

Actions

- Glenohumeral - Abduction, flexion, horizontal adduction and medial rotation



Middle Fibers

Origin:

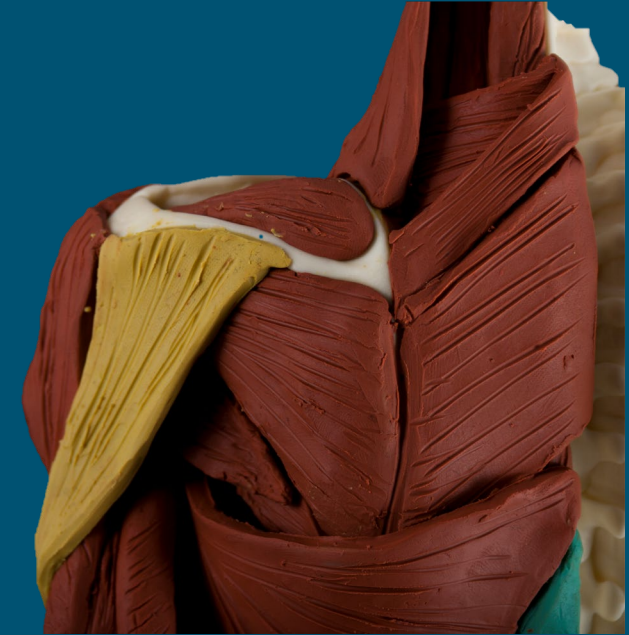
- Lateral aspect of acromion.

Actions

- Glenohumeral - Abduction

Insertion all fibers:

- Deltoid tuberosity on the lateral humerus.



Posterior Fibers

Origin:

- Inferior edge of scapular spine.

Actions

- Glenohumeral - Abduction, extension, horizontal abduction and lateral rotation

Trapezius



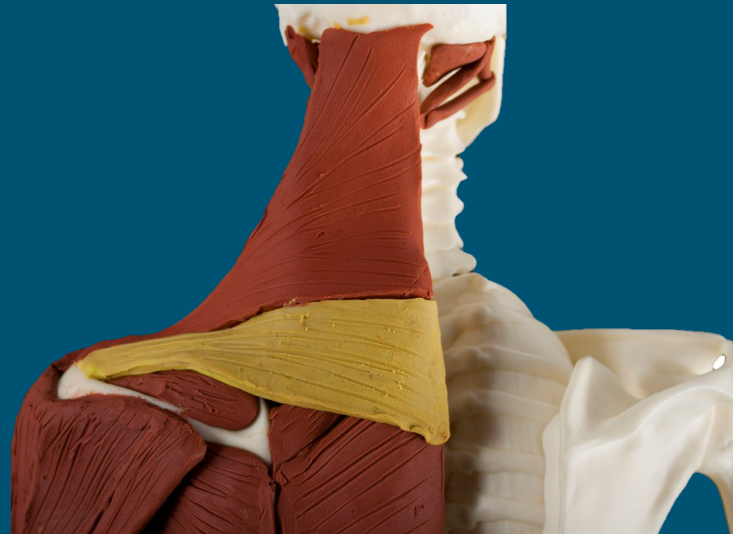
Upper Fibers

Origin

- Base of skull, occipital protuberance and posterior neck ligaments

Insertion

- Posterior aspect of the lateral 3rd of the clavicle



Middle Fibers

Origin

- Spinous processes of 7th cervical and upper three thoracic vertebrae

Insertion

- Medial border of acromion process and upper border of scapular spine



Lower Fibers

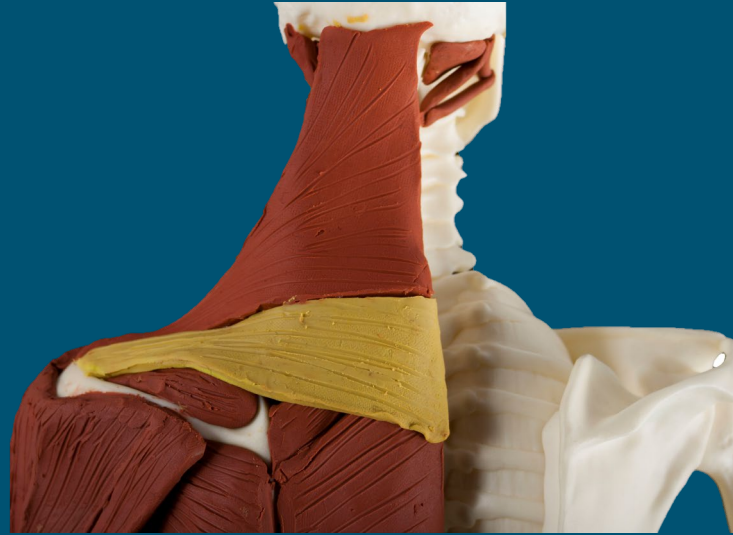
Origin

- Spinous processes of 4th through 12th thoracic vertebrae

Insertion

- Triangular space at base of scapular spine

Trapezius



Actions:

- Upper Fibers
 - Bilaterally - Extend head and neck.
 - Unilaterally - Laterally flex head and neck to same side, rotate head and neck to opposite side, elevate and upwardly rotate scapula
- Middle fibers – Adduct and stabilize scapula
- Lower – Depress and upwardly rotate scapula

Sternocleidomastoid

Origin

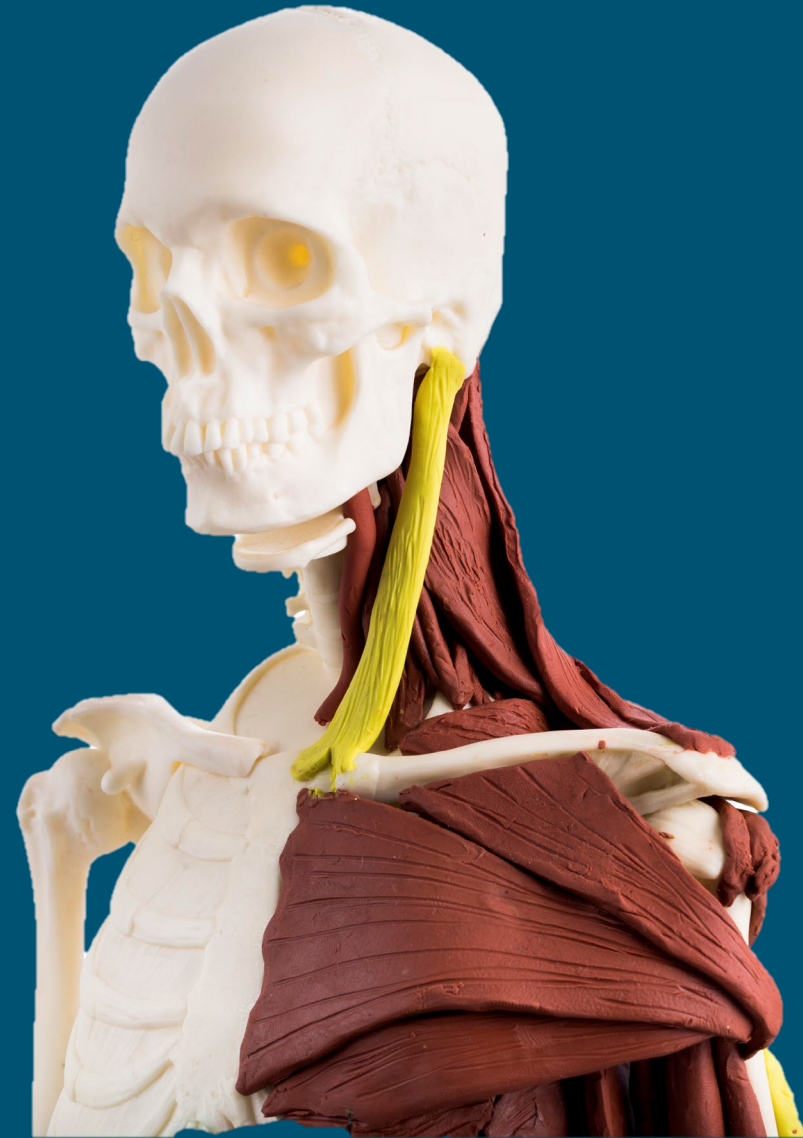
- Manubrium (sternum = sterno) and medial end of clavicle (=cleido).

Insertion

- Mastoid process and temporal bone of the skull.

Actions:

- Bilaterally extends the head.
- Unilaterally flexes the head to the same side and rotates to the opposite side.



Glenohumeral Joint in Motion

MUSCLES	Flexion	Extension	Adduction	Abduction	Horizontal Adduction	Horizontal Abduction	Medial Rotation	Lateral Rotation
Lattisimus Dorsi		X	X			X	X	
Pectoralis major Upper fibers	X		X				X	
Pectoralis major Middle and Lower Fibers		X	X		X		X	
Deltoid Anterior Fibers	X			X	X		X	
Deltoid Middle Fibers				X				
Deltoid Posterior Fibers		X		X		X		X

Trapezius in Motion

MUSCLES	HEAD AND NECK MOTION			SCAPULAR MOTION			
	Extension	Lateral Flexion	Rotation to Opposite Side	Upward Rotation	Elevation	Depression	Retraction
Trapezius Upper Fibers	X	X	X	X			
Trapezius Middle fibers							X
Trapezius Lower Fibers				X		X	
Trapezius All Fibers	X			X			



Thank you for coming!

For more information on:

- Anatomy + Movement skeletons
- AI3D course
- Other Balanced Body courses, equipment and curriculum

Contact us at pilates.com

May this course be of benefit to you and your students